Vector Protocol v0.7 – Trail Structure Specification

Date: 2025-05-22

This version introduces the Trail entity: a ledgered sequence of semantic traversals that constitute a verifiable path through thought, feeling, memory, or reasoning.

# 1. Definition

A trail is a first-class ledgered structure representing a meaningful sequence of steps taken through the Vector space. It may describe cognitive, emotional, perceptual, ethical, or creative progressions. Trails are traversable, compressible, and challengeable.

# 2. Structure

A trail is declared using the following form:

trail("name") := [  
 traversal\_1,  
 traversal\_2,  
 ...  
]

Each element may be:

* • A ledgered node
* • A perception, emotion, action, belief, or value
* • A traversal (e.g. compare, challenge, simulate, compress)
* • A nested trail

# 3. Trail Types

* • Memory trails: record past experience or causality
* • Cognitive trails: encode stepwise reasoning
* • Emotional trails: encode affective transitions
* • Simulated trails: forecast or imagine outcomes
* • Narrative trails: describe origin of beliefs or creations

# 4. Operations on Trails

* • traverse(trail) – walks each step, simulating cognition or memory
* • compress(trail) – attempts to condense trail into a conceptual node
* • compare(trail\_A, trail\_B) – computes divergence or similarity
* • challenge(step) – raises an objection to a step in the trail

# 5. Agent Ledgering

Agents may store, protect, or share trails. A trail can have permissions and may include challenge flags or resolution states. Agents may reference trails as proofs-of-process for beliefs, creations, or decisions.

# 6. Example: Reasoning Trail

trail("idea\_birth") := [  
 perception("gap in model"),  
 simulate("new structure"),  
 compare("old vs new"),  
 stabilize("new idea"),  
 value("truth over tradition")  
]

# 7. Summary

Trails allow agents to encode and share how meaning, emotion, logic, and identity emerge over time. They form the basis for semantic autobiography, epistemic audit, and creative lineage. This makes Vector not just a model of structure, but a record of transformation.